

Goddard Higher Education

outlook

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Issue 1

March 2007

Message from the Chief of Higher Education

2006 Top Ten List

2006 was an extraordinarily busy year for the Office of Higher Education (OHE). One important event was getting our name changed. We used to be *University Programs*, but this past year we completed the paperwork necessary to become *Higher Education*. To many people, that's not such a big deal, but of course we're part of a bureaucracy where things are done carefully. After much consideration, we are not including it, however, on our sometimes annual list of the top 10 events of the year. The selection committee also decided this year against rank ordering the events, and left that as an exercise for the reader. Below are the winning events in almost random order. Prizes were only awarded in a limited number of cases, but those were really good ones.

10. Recognition. John Mather won the Nobel Prize. After he received his Ph.D., John was a Postdoctoral Fellow at Goddard's Institute for Space Studies located near Columbia University in New York City. He was in a NASA Headquarters program managed at Goddard by OHE, which is now called the *NASA Postdoctoral Program (NPP)*. It has at any one time about 50 recent Ph.D.'s doing research in Astrophysics, Earth Science, Heliophysics, or Solar System Exploration. John stayed with Goddard ever since. John practiced for his Stockholm Nobel Lecture by talking to high school students, college students, and the general public at an event co-sponsored by Goddard (OHE) and the University of Maryland. Over 500 people showed up to help him practice. With their help, Stockholm went very well. A full account is elsewhere in this newsletter. You will also want to know that, a few months earlier, John, on behalf of the *Cosmic Background Explorer (COBE)* team, was awarded the 2006 Gruber Prize, which comes with a few hundred thousand dollars. These awards, in addition to recognizing John and his colleagues, have a broader significance for NASA. They recognize, for the first time at the Nobel level, the importance of a new way of doing science—the fact that

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2007 Space Grant Meeting to be Hosted by GSFC

By Dave Rosage

The 2007 Mid-Atlantic Regional Space Grant meeting will be coordinated through the DC Space Grant Consortium with most of the event hosted at the Goddard Space Flight Center. The specific dates have not been announced, but it typically takes place during the later part of September over a three day period. Details of the meeting will be provided in the next issue of this newsletter.

by putting sophisticated apparatus in space, you can achieve scientific results that are not possible here on Earth.

9. Big Crowd. Summer interns at Goddard in OHE-linked programs totaled just under 200 (mostly) happy campers. They lived together in fraternity houses at the University of Maryland and had a variety of joint activities, ranging from athletics to a barbecue to weekly joint dinners accompanied by exciting (at least to some) lectures. We are busy planning for summer '07 and would welcome any suggestions from '06 people as to (in the words someone once said when his third child was about to join the family business) “how to avoid making the same mistakes with him we made with you.” We would also welcome suggestions from anyone else. The object is to make the experience maximally productive and enjoyable for all concerned.

8. Engineering. OHE—working with the Goddard's Applied Engineering and Technology Directorate (AETD), and its Deputy Director for Planning and Development, Bruce Butterworth—is engaged in a historic education enterprise. There are about three dozen Native American Tribal Colleges and Universities (TCUs). A few TCUs have programs under which you can study at the TCU for a couple of years and then switch to some other school to get a bachelor degree in engineering, but no TCU has an accredited program, itself, for awarding a bachelor's degree in any form of engineering. OHE and AETD are hoping to change that. We are helping Montana's Salish Kootenai College (SKC) inaugurate a B.S. in Computer Engineering. They have a far-sighted President and a small, but enthusiastic and talented science department. We are supporting them with curriculum suggestions, distance learning, and an advisory committee. There are two students now expecting to get degrees in May 2008 in computer engineering.

7. Migration. The NASA-wide Office of Education's *Tribal College and University (TCU) Project* has “migrated” to Goddard. As part of a new HQ move to have Agencywide education projects managed by Centers rather than HQ, Goddard was competitively selected to manage the TCU Project. Our plan is to make sure there is plenty of input from TCU faculty and students, and to increase the involvement of the other NASA Centers in the effort. Janie Nall of our office was instrumental in GSFC's winning application.

6. Exploration. We started a new summer intern program in '06: the HQ *Exploration Systems Mission Directorate* (ESMD) funded an OHE team led by OHE Deputy Richard Fahey, joined by OHE's Mablelene Burrell and Howard University's Joshua Halpern. They have created a

program of faculty/student teams at Goddard working on projects of interest to ESMD. About half a dozen teams did useful work in a variety of projects. Enough useful work was done that ESMD is funding us again for summer '07, and also will be funding the same program at a couple other Centers. We very much appreciate the ESMD funding.

5. Women in Science. During the spring semester, OHE's Dr. Lubna Rana runs a lecture series, *Eyes on the Sky*, for high school students, college students, and the general public. In '06, she added a short precursor series of lectures on “The Making of a Scientist” featuring four different women in Space Science. The lead lecture was by the former Chief Scientist of NASA, now Deputy Director of the National Science Foundation, Dr. Kathie Olsen. Dr. Olsen, besides describing her research, said that she was not much interested in science until late in high school when one of her courses made her realize that it is way cool.

4. Robots. For the second summer, the *Science Mission Directorate (SMD)* funded a program, under David Rosage and Dr. Lubna Rana, in which small teams of college freshmen and sophomores interested in robotics and led by an upperclass robotics major or graduate student, do research in robotics for Goddard principal investigators (or for PIs from neighboring institutions). In '06, the program was duplicated at another NASA Center and the plan is for it to be extended to a third in '07. We very much appreciate the SMD funding.

3. Teaching Teachers. Dr. Rana and Mablelene Burrell organized a two-week *Teachers' Advanced Study Institute (TASI)* for a dozen and half local high school teachers. The institute focused on NASA's *Beyond Einstein* program, which plans two major space observatories; a constellation of three spacecraft in a triangle with legs of five million kilometers that will detect, for the first time, passing gravitational waves; and a new, advanced orbiting x-ray telescope that will study the details of black holes by detecting with exquisite precision the x-rays emitted by material falling into the holes. TASI also went into the three other smaller *Beyond Einstein* missions, and emphasized the new “teaching by inquiry” approach to physics teaching.

2. Interest from Headquarters. Over the past few years, OHE's Johnny Erickson has developed, enlarged, and perfected the new, unified and user-friendly online application that now services all OHE summer intern programs as well as the NASA Academy and the NASA Robotics Academy at the

other Centers that have those programs. Its clarity, efficiency, and facility have brought such glowing testimonials from both sides of the transmissions that Dr. Mabel Matthews, Director of Higher Education, has expressed some casual interest in exploring the possibility of extending its use NASA-wide. Users of the unified application should be aware that Johnny cannot accept gifts of money or other tangible or negotiable items, but is okay with cards, letters, and the occasional e-mail (and the same holds for Dr. Matthews).

1. Foreign Travel. John Mather won the Nobel Prize. After he received his Ph.D., John was a Postdoctoral Fellow at Goddard's Institute for Space Studies located near Columbia University in New York City. He was in a NASA Headquarters program managed at Goddard by OHE, which is now called the *NASA Postdoctoral Program* (NPP). It has at any one time about 50 recent Ph.D.s doing research in Astrophysics, Earth Science, Heliophysics, or Solar System Exploration. John stayed with Goddard ever since. John practiced for his Stockholm Nobel Lecture by talking to high school students, college students, and the general public at an event co-sponsored by Goddard (OHE) and the University of Maryland. Over 500 people showed up to help him practice. With their help, Stockholm went very well. A full account is elsewhere in this newsletter. You will also want to know that a few months earlier, John, on behalf of the *Cosmic Background Explorer* (COBE) team, was awarded the 2006 Gruber Prize, which comes with a few hundred thousand dollars. These awards, in addition to recognizing John and his colleagues, have a broader significance for NASA. They recognize, for the first time at the Nobel level, the importance of a new way of doing science—the fact that by putting sophisticated apparatus in space, you can achieve scientific results that are not possible here on Earth. §

Vic Teplitz

NASA Academy and Robotics Academy Group Projects

By Dave Rosage

The NASA Academy, consisting of 20 Research Associates—all junior/senior undergraduate and graduate engineering and science majors, selected their required group project and called it EAGLE (**Enceladus Astrobiology and Geophysics Lander Expedition**). The concept and design study was completed in 10 weeks resulting in a 69-page published report. Since the NASA Academy ended on August 10, their group project was featured in the September issue of *Air & Space* magazine. The team was also invited to present their project at the American Astronomical Society (AAS) conference at (the Jet Propulsion Laboratory) JPL in October, as well as the (Association of Professional Engineers and Geoscientists) APEG conference in Tucson, Arizona. A copy of the Academy's Group Project report can be obtained at <http://academy.gsfc.nasa.gov/2006/research/group/index.jsp>.

The NASA Robotics Academy, consisting of 29 Research Associates (freshman/sophomore undergraduate and graduate students) combined their talents to design and construct a simple and inexpensive educational robot kit to teach kids science and engineering fundamentals. The robot kits consisted of a Line-Following Robot and a Wall-Following Robot. The design of the basic robot consisted of one caster and two wheels powered by a 344:1 gearbox, small breadboard for different circuit layout, and a rigid Styrofoam body. The Morgan State Summer Institute of Robotics tested the robot kits as part of their program for consideration of future use by this program. The 2006 Robotics Academy, now alumni, continues to refine the design and plan to develop a marketing plan to sell the kit over the Internet as a means of fundraising for the NASA Robotics Academy Alumni Association. §



NASA Academy 2006



Robotics Academy 2006



NASA Teachers' Advanced Study Institute

By Lubna Rana

Inspiring current and future generations is a key feature of the President's Exploration Initiative. It underscores the role played by teachers and emphasizes that "the greatest impact will come from expanding programs to train teachers of science, mathematics, and technology."

In line with this goal, this past summer, the Office of Higher Education introduced a new concept: The Teachers' Advanced Study Institute, or TASI, as we like to call it. The central goal of TASI was to create a think tank for teachers with a focus on cutting edge topics in astrophysics and cosmology associated with NASA's *Beyond Einstein* program, as well as the best contemporary work in science education research to produce ideas for teaching science as inquiry. Furthermore, TASI was designed to serve as a breeding ground for a sustainable support network of scientists and science teachers. Such a professional development opportunity which combines exposure to frontiers of science as well as a broad spectrum of new ideas in science teaching does not exist in this country.

TASI was held from July 17–28. Sixteen area high school teachers (with the exception of one teacher from Miami) were selected for the inaugural class. TASI 2006 focused on the question of the accelerated expansion of the universe and dark energy. The list of scientists who participated was very much a "who's who" in the field including Gary Hinshaw, Jonathan Gardner, Dominic Benford, Kimberly Weaver, and Ann Hornschemeier from GSFC; Professors Cole Miller, Ted Jacobson, and Jim Gates from the University of

Members of the NASA Teachers' Advanced Study Institute

Maryland, College Park. As a special treat for the teachers, the final talk was given by Professor Adam Riess of The Johns Hopkins University, who was the principal investigator of the *Harvard Supernova* project that made the initial discovery of the accelerated expansion of the universe.

The second core element of TASI was workshops with Professors Joe Redish and David Hammer from the University of Maryland, College Park, and Professor Eugenia Etkina from Rutgers University—three of the leading science education researchers in the country. A team of education specialists from the Space Telescope Science Institute also visited the institute and held a workshop for the teachers.

TASI also featured a number of social events. In addition to a crash, but successful, barbecue produced by the teachers, two gala receptions were held with Dr. Paul Hertz, NASA Chief Scientist, Science Missions Directorate, and Dr. Shelley Canright, the Acting Director of Elementary and Secondary Education, who were invited to come and speak to the teachers about NASA's science and education vision and interact with them informally.

The program was very well received by the teachers. They especially valued the exposure to the "hot off the press research presented by people who performed the research," and the scientists' "refusal to dumb down the content" and provide a "challenging environment for the teachers." The Office of Higher Education continues to maintain a relationship with the participants of TASI 2006 and will seek further opportunities to bring them back to NASA. §

Doing Faculty Summer Fellowships Right

By Josh Halpern

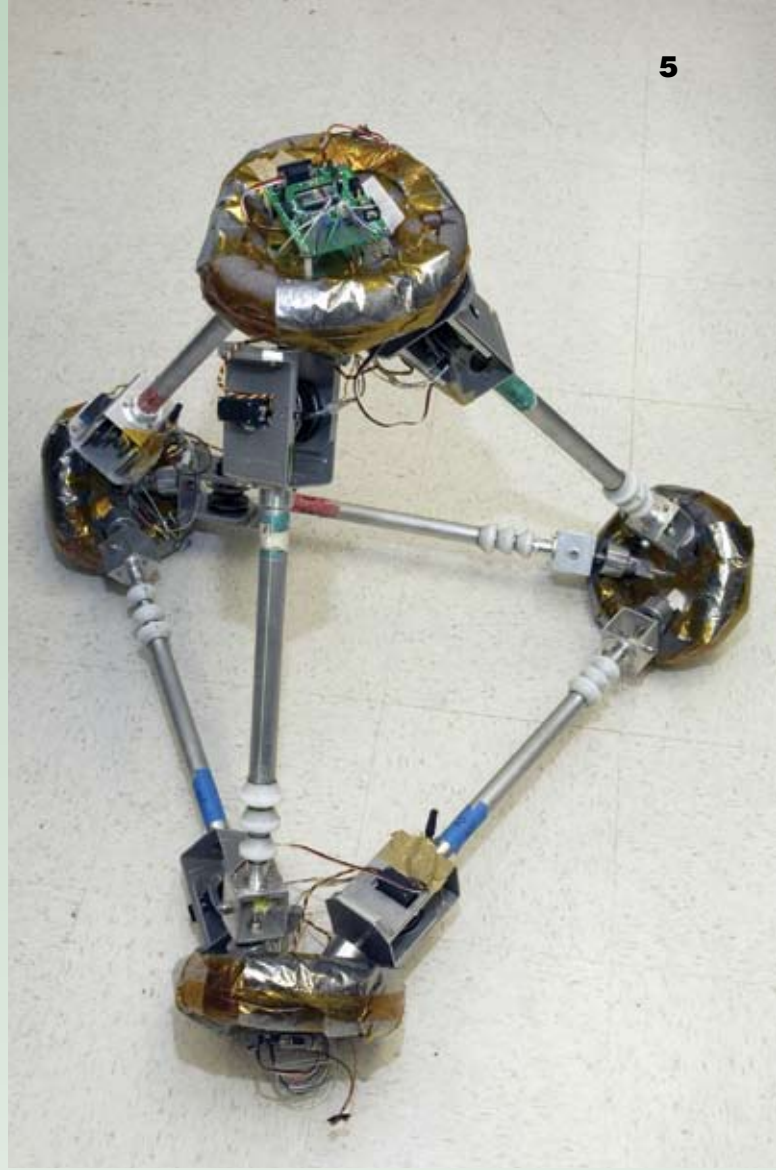
Both NASA and faculty know that the ideal outcome of a summer research opportunity is a long-term relationship that supports research, student training, and careers. This summer, the Exploration Systems Mission Directorate (ESMD) supported a pilot program at Goddard that tried to reach this ideal. Dr. Richard Fahey of the Office of Higher Education applied the many lessons learned from past programs to build the Faculty/Student Teams (FaST) program bringing eight groups of faculty and their students to Goddard for the summer, with an academic year follow on, and the opportunity to return to GSFC during the coming summer.

The FaST program emphasizes building teams of faculty, student interns, and NASA mentors. The immediate goals are to support ESMD research, provide faculty and students an intense introduction to ESMD and NASA R&D, and build links between NASA and the universities. The eight teams made a good start this summer. Each had significant research accomplishments, among which were the following:

- Designed new low voltage-low power high performance circuit building blocks for infrared sensor readout electronics that are being built at New Mexico State University.
- Designed adaptive decentralized controllers for strut control of Tetrahedral (TET) robots and gait animations that led to significant redesign for the third generation 12-TETs.
- Recommissioned the Goddard light gas gun and used it for characterizing geophysical properties of rock samples similar to what one might find on the Moon.
- Contributed to the development of carbon nanotube magnetic sensors. This work continues with the NASA investigator making use of facilities at Brigham Young University as well as NASA.
- Developed a one-stage prototype “micro-scale” Electrohydrodynamic (EHD) conduction pump.
- Conducted a baseline study of Institute of Electrical and Electronics Engineers (IEEE) 802.16e as a communications standard for ESMD missions.

While originally only one student from each institution was expected, the faculty team leaders asked to bring more than one, and ESMD came through with additional support. The largest teams ended up with four students. Another nice surprise was that the FaST teams acted as nucleation sites for students in other GSFC summer internship programs. The faculty member’s availability enhanced and expanded mentoring possibilities for other students.

A central issue for summer programs is follow-on for research, training and career choices. Student internships bring short-term benefits to the organizations where the interns work; they surely benefit the interns, and sometimes lead to career choices that internship sponsors desire. Yet, there is a low multiplier effect beyond goodwill communicated to other students after a good experience. Faculty programs have the potential for longer-term involvement coupled with a more mature and sophisticated intellectual exchange. The primary workforce benefit is the ability of faculty to act as talent spotters and steer their students to NASA careers. By combining faculty/student summer internships and paying attention to academic year follow-on, we hope to enrich the benefits of both types of programs. §



Tetrahedral Walker prototype

Nobel Prize Winner Lecture, John Mather

By Lubna Rana

You had to have been there. As the stage slowly rotated and John Mather appeared before the jam-packed auditorium, the crowd instantaneously rose to its feet. You could sense the shared pride of hundreds of people—scientists, students, teachers, and members of the local community—who had gathered to hear John practice the talk he will give in just a few short days to the Royal Swedish Academy of Science. And you could see the thrill on John's face as he beamed and stood tall and then bowed graciously.

This public celebration in honor of NASA's first Nobel Prize winner was one of the premier Fall 2006 events organized by the Office of Higher Education. It was held on Tuesday, November 14 at the University of Maryland (UMD), College Park, in close partnership with UMD's Department of Physics where John is an adjunct professor. Dean Stephen Halperin welcomed the guests and introduced Goddard Center Director, Ed Weiler, who in turn introduced John Mather.

This, however, was not John's first standing ovation. He had received one several years ago at the 1990 American Astronomical Society meeting when he presented the now famous perfect blackbody curve of the Cosmic Microwave Background (CMB) spectrum measured by COBE. The best measurement of the CMB spectrum was made by the Far Infrared Absolute Spectrophotometer (FIRAS) on COBE. John was the study scientist (1976–88) and project scientist (1988–98) for COBE and the principal investigator for FIRAS. The discovery of the anisotropies of the CMB spectrum detected by COBE was heralded by Stephen Hawking as the “discovery of the century, if not of all time.”

As the Nobel Prize press release noted, COBE provided us with “pictures of a newborn universe” and the “discovery of the blackbody from, and anisotropy of, the cosmic microwave background radiation” provided support for the Big Bang theory of the origin of the universe. But the prize recognizes more than the landmark science achievement and more than the work of the hundreds of people who made COBE's success possible.

It recognizes the coming of age of science out of this world, done by scientists with the ability to ensure that engineering maximizes scientific return, foresight to guard against problems that could occur, and ingenuity to surmount problems that do occur—all in the hostile environment of outer space. The prize recognizes both John's achievement and this new way and place of doing fundamental basic science. [S](#)



Dr. John Mather, NASA's first Nobel Prize winner

Dr. Mather gives autograph and answers questions at lecture





The Grand Hotel, Stockholm, Sweden

Mather Receives Nobel Prize in Stockholm

By David Schuman (Guest Contributor)

I hope you will appreciate these impressions from a quick trip to Stockholm, Sweden, this past week to participate in activities surrounding the presentation of the 2006 Nobel Prize in Physics to our own John Mather. It was certainly one of the great highlights of any NASA career and a once-in-a-lifetime experience. Others can no doubt provide interesting perspectives.

I attended not as a COBE team member, or distinguished scientist or engineering colleague, but rather as a Goddard employee interested in John's work. My only official involvement was to help in the preparation of an ethics determination to enable John's receipt of the prize proceeds, which are substantial. We're getting rather good at this because John has won a number of awards, most recently the Cosmology Prize of the Peter Gruber Foundation in July.

I had always wanted to visit Sweden and this was the perfect excuse. In fact, there's none better. It's not everyday a colleague is the recipient of a Nobel Prize, although considering the caliber of the colleagues and clients we're privileged to work with, I hope and expect it won't be the last!

Travel North

I attended with Ed Goldstein, a writer/editor from NASA Headquarters who provided John with some ideas for his speech. With only gentle cajoling, we convinced ourselves we needed to be in Stockholm for these events and, with a little bit of leave, arrived through Reykjavik, Iceland, courtesy of Iceland Air, in the beautiful city of Stockholm, Sweden, on Thursday, December 7th. Swedish public transportation is

a model of efficiency. We took the 120 mile-per-hour high speed train from Arlanda airport and the T-bana (metro) to our hotel on the outskirts of Stockholm. A weekend pass covered all metro travel and we never waited more than 5 minutes for a train. The escalators in the stations start when you board. Metro could take a lesson or two.

This time of year is the off-season for travel to Sweden. Because of the high latitude, daylight lasts from approximately 8:30 a.m. to 3:00 p.m. It's pitch black by 3:30. It's normally quite cold, although we had abnormally warm weather, in the 40s, this trip.

The Nobel Prize Lecture

Friday morning, the 8th, we made our way to Aula Magna (the Great Hall) of Stockholm University, where the Nobel Prize lectures were to take place. It is a large facility holding perhaps 1500 people. The Nobel Prize lectures are open to the public and, in addition to the scientists and engineers that had worked with John on COBE, there were many students present. On arrival, we were surprised to see other folks from Goddard including James Webb Space Telescope (JWST) people involved in Integrated Science Instrument Module (ISIM) work with the European Space Agency (ESA) who had flown up from Noordvik. I said hello to Mike Ryschewitsch, Pam Sullivan, and Mike Hauser, and was able to wish John good luck and shake his hand before he went up on stage. I think John was very pleased to see some Goddard folks in attendance.

Per Carlsson, head of the Physics Committee of the Royal Swedish Academy of Sciences introduced John and George

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Smoot who followed. For nearly an hour, John gave the same beautiful overview of the cosmic microwave background research, COBE, and JWST we had heard him give before. He was especially thoughtful in recognizing his predecessors and team members, and especially spouses of team members. Of course, John received a stirring ovation and was mobbed by autograph seekers, after George Smoot's presentation. There was such a commotion that the next speaker, the Nobel Prize winner for Chemistry, Roger Kornberg, was able to prepare for his own presentation at the podium in relative anonymity. In a remarkable turn of events, Kornberg was selected 47 years after his father received the prize for medicine. Ed Goldstein was able to conduct interviews with Per Carlsson and Jane Mather. John's speech is available at the following link: http://nobelprize.org/nobel_prizes/physics/laureates/2006/mather-lecture.html.

The Nobel Prize Concert

Friday evening, we made our way to the Stockholm Concert Hall in downtown Stockholm for the Nobel Prize Concert, a tradition started just last year to honor the medal winners. I'm not a huge fan of opera, but was surprisingly very impressed by Grammy winner, Renee Fleming, along with the Royal Stockholm Philharmonic Orchestra. She belted out some really nice pieces, including three encores, standing right in front of the medal winners and their spouses seated in the front row. She said it was such an honor for her to make her Stockholm debut in front of Nobel Prize winners. One interesting aspect of this experience is the presence of the "royals" in their own box. One is expected not to leave, until the royal party has done so. During intermission, I said a few words to John, Mike R., and Dick Shafer. I told Mike R. the real reason to come to these events was to see all the engineers dressed up in suits and ties.

The Nobel Prize Museum and Stockholm

On Saturday, the 9th, we toured the Nobel Prize Museum and viewed a number of short films on previous Nobel Prize winners including Marie Curie, Alexander Fleming, Nelson Mandela, Isaac Bashevis Singer, Watson and Crick, Barbara McLintock, and Martin Luther King. There was a special exhibit on Winston Churchill, as well as the main exhibit on Alfred Nobel. And there was a line out the door of the gift shop where the Nobel Prize winner for Literature, Orhan Pamuk, was signing copies of his books. Later on, while out to dinner in the old section of Stockholm, called Gamla Stan, completely at random we happened to sit next to a nice lady who had translated Mr. Pamuk's work from the original Turkish into Swedish. As a result, she had been invited to attend the medal ceremony itself. She was fascinated by our own Nobel Prize winner.

At the Nobel Museum, I was especially interested in copies of Alfred Nobel's will, in the original Swedish, with English translation, wherein he laid out his concept for the prizes. Following a short section where he distributed certain proceeds to his surviving relatives, he stated:

"The whole of my remaining realizable estate shall be dealt with in the following way: the capital, invested in safe securities by my executors, shall constitute a fund, the interest on which shall be annually distributed in the form of prizes to those who, during the preceding year, shall have conferred the greatest benefit on mankind. The said interest shall be divided into five equal parts, which shall be apportioned as follows: one part to the person who shall have made the most important discovery or invention within the field of physics...It is my express wish that in awarding the prizes, no consideration whatever shall be given to the nationality of the candidates, but that the most worthy shall receive the prize whether he be Scandinavian or not."

All of this put John's achievements in perspective and brought tears to the eyes. I resisted the temptation to pick up a box of commemorative chocolate Nobel Prize medals at the gift shop.

With the daylight remaining on Saturday, Ed and I visited the Royal Palace where we saw the changing of the guard, and the Grand Hotel, where the Nobel Laureates and their guests were staying. The Hotel, and the city skyline, had a surreal feel as they were bathed in the glow of the evening twilight. Stockholm is a gorgeous city and it was torture to see so little of it.

The Astronaut

As an interesting coincidence, during the time we were in Stockholm, the Space Shuttle launched with Sweden's first astronaut on board, Christer Fuglesang. His story was front-page news in all the papers. It's interesting to see a shuttle launch portrayed in foreign tabloids covered by Swedish with exclamation points. Ed conducted a number of interviews with the local populace on the extent of their interest in Fuglesang's trip. In a story come full circle, today's *Washington Post* carried a picture of Fuglesang making his first spacewalk along with astronaut Robert Curbeam. Before returning to the Shuttle, Curbeam was quoted as saying, "I just want to say congratulations to all the Nobel Prize winners this year and especially to John Mather from Goddard Space [Flight] Center," this year's physics honoree. "We're proud of you."

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Morgan State Summer Institute of Robotics

By Dave Rosage

The 2006 Morgan State Summer Institute of Robotics consisted of two, two-week sessions designed to provide students with the opportunity to learn and discover the science and technology of robot design and operation. The first session took place from June 26 to July 2, with 16 urban city high school students. The second session took place from July 24 to August 4 and had 15 participants. In this high school level program, students learned:

- Introduction to Robotics
- Mechanical Platforms: Design and Physical Properties
- Microcontroller Systems
- Computer Science
- Presentation and Public Speaking Etiquette

Morgan State University's School of Engineering developed and coordinated this program. More specifically, the program was jointly operated by the Department of Electrical and Computer Engineering, and the Department of Industrial Engineering at Morgan State University in collaboration with Goddard's Office of Higher Education. Each department provided laboratory space and student assistants to help with the program under the direction of engineering faculty.

On September 21, a graduation and awards banquet was held at Goddard for the students, staff, and their families. Students, their siblings, and program staff were recognized for their achievements and encouraged to continue thinking about fields related to NASA. The program will be continued during 2007. §

Left: Summer Institute of Robotics (SIR) students, Session 1; SIR Graduation; Summer Institute of Robotics students, Session 2



Mather Receives Nobel Prize in Stockholm, continued from page 8

Acceptance Speech

The banquet and medal ceremonies on Sunday are by invitation only. John gave a short, but incredibly moving speech, on the subject of light. It is a poignant model for gracious acceptance speeches. If it's the only thing you read with respect to the Nobel Prize, read this one, available at: http://nobelprize.org/cgi-bin/print?from=/nobel_prizes/physicists/laureates/2006/mather-speech.html.

Reactions and Interactions

Finally, I should convey a personal reminiscence that made this trip so moving for an ordinary NASA employee. I ran into many Swedes on the street. The Swedes all speak perfect English. They learn it as children after Swedish, as a matter of course, before studying an official second language later on in school. They were interested to find out I was an American traveling in Stockholm in the dead of winter when it's normally very cold, and very short on daylight. The usual question was, "So what brings you to Stockholm." I responded, "Well, the Nobel Prizes actually." The follow-up would be, "Oh really, what's your involvement?" In

Stockholm, and throughout Sweden, the prizes are a very big deal, with events surrounding them taking place throughout the entire week. Perhaps the Swedes were expecting a more pedestrian answer, but I responded in all sincerity with, "One of my colleagues won the physics prize." This stopped everyone dead in their tracks and led to many very interesting conversations, in all manner of locations.

I can't resist one anecdote. Because I'm a Lindy-hopper, a form of swing dancing, I visited one of the Swedish dance places on Saturday night, oddly enough called, "Chicago." The Swedes are very much interested in this uniquely American form of dance that developed in Harlem in New York City in the late 1930s. Amidst the noise from the band, and the crush of the crowd, I found myself explaining in layman's terms the finer points of the cosmic microwave background radiation to a very interested, attractive flight operations engineer from Scandinavian Airlines. At least I think she was interested.

Congratulations, John, and to everyone who worked on COBE! §

NAFP/JPPF/CIPA Symposium to be Co-hosted by GSFC in 2008!

By Adrienne Byrd

NASA Administrators' Fellowship Program (NAFP)

Harriett G. Jenkins Pre-doctoral Fellowship Program (JPPF)

Curriculum Improvement Partnership Award (CIPA) Program

For the past five years, a NASA Center has agreed to co-host the NAFP/JPPF/CIPA Symposium along with the United Negro College Fund Special Programs (UNCFSP) Corporation. Since 2005, Ames Research Center (2005) and Marshall Space Flight Center (2006) co-hosted the symposium. Glenn Research Center will co-host the symposium in 2007. Goddard has graciously accepted the invitation to co-host the annual symposium in 2008! During the symposium, program participants attend joint and concurrent sessions with various activities that include keynote speakers, roundtable discussions, professional development panels/workshops, team building activities, faculty and student presentations, and a NASA Center tour. Three programs participate in the Symposium: NAFP, JPPF, and CIPA.

The descriptions for the three programs that follow are taken directly from the *2005 UNCFSP Annual Report*. The **NAFP** enhances the professional development of NASA employees and faculty from Minority Institutions (MIs) and builds and strengthens the Science, Technology, Engineering, and Mathematics (STEM) infrastructure of MIs. NASA employee fellows teach and/or conduct research at MIs, while MI faculty fellows conduct research at NASA Centers. All NAFP fellows engage in a comprehensive, integrated professional development curriculum to equip them with the skills to become progressive change agents in their organization and institutions. Curriculum areas include leadership development, effective communication, strategic thinking and planning, STEM education policy and review, proposal writing, project management, and federal and state relations.

The mission of the **JPPF** is to increase the number of women, minorities, and persons with disabilities participating in the STEM workforce, thereby helping to eliminate the shortage of skilled workers in STEM-related disciplines. Moreover, the JPPF facilitates the development of a more inclusive, multicultural and sustainable workforce by providing access and opportunity to those underrepresented and underutilized persons of society who want to earn advanced degrees.

The **CIPA** is the third program that assists two-year MIs with strengthening their STEM academic fields and technical programs. Some examples of CIPA activities include the development of a Bioscience Improvement Center and an undergraduate minor in the field of computerized measurements and instrumentation. The current CIPA II Program also integrates project management methodology to strategically enhance STEM curricula. Through the infusion curricula, MIs will be able to groom students for success in NASA and aerospace-industry careers by providing both theoretical knowledge and "real-world" experiences.

For the symposium, Goddard scientists, engineers, senior level managers, and education personnel will be asked to give presentations. We are very excited to co-host the NAFP/JPPF/CIPA symposium in 2008. Program Fellows not only gain professional development, but also present their research and have the opportunity to network with new collaborators. By co-hosting the symposium, the Program Fellows will have an opportunity to learn about the exciting research conducted at GSFC, which they can pursue in their future academic and professional careers! §



NAFP/JPPF/CIPA Symposium 2006 session

Higher Education Staff Update

Ms. Joanna Woody left the Office of Higher Education in April, to devote herself full-time to her studies at Bowie State University. Ms. Woody joined the Office in 2003 as a Cooperative Office Education student and made many valuable contributions and enhancements to our programs.

The Office welcomes our Stay-In-School student, Tiffany Russell. Tiffany is an alumna of Goddard's 2006 NASA Academy.

Dr. Joseph Dolan has retired after over 30 years of service to Goddard. Dr. Dolan joined the Office of Higher Education in 2005 and provided support to the NASA Postdoctoral Program, the Jenkins Pre-doctoral Fellowship Program, and served as dean to our student internship programs. We wish Dr. Dolan well in retirement.

The Office welcomes Dr. Nancy Maynard, a Senior Research Scientist in the NASA GSFC Cryospheric Sciences Branch, with an interest in the use of remote sensing to observe changes (environment, climate, land use/cover) in the Arctic and their impacts on populations and human health. Previously, she was Director of the GSFC Environment and Health Program, where she was responsible for a NASA interdisciplinary environment and health initiative. She has also worked on remote sensing of ice edge biota, management of large interdisciplinary science programs (e.g., at NASA HQ), and science policy at the White House Office of Science & Technology Policy (OSTP) for more than five years and served three different presidents. She is currently working on Landsat and other remote sensing imagery of reindeer pastures in Northern Norway and Eurasia as a continuation of the Reindeer Mapper project with colleagues from the Saami University College in Norway. She brings a wealth of experience and passion to support our Tribal College and University Program. Dr. Maynard received a B.S. in biology and chemistry from Mary Washington College; M.S. and Ph.D. degrees in zoology and marine biology, respectively, from the University of Miami; and she was a postdoctoral fellow at Harvard University and an NRC Fellow at JPL.

The Office of Higher Education also welcomes Ashok B. Desai, an engineer with the Electromechanical Systems Branch. Dr. Desai came to Goddard after a long career in private industry doing engineering design. Dr. Desai has worked on standard electronics box design in the Electronics Packaging Group and served on the evaluation board for the multi-chip module packaging. Dr. Desai brings engineering expertise to the Office and will serve as a dean for our intern programs.

The Office also welcomes Dr. Shavesha Rutledge, an Aerospace Engineer in the Parts, Packing, and Assembly

Technologies Office at Goddard. At Goddard, she provides technical support and procurement options for spaceflight projects to ensure that materials used for parts are reliable and acceptable for military and industry standards. Previously, she was a fellow in the NASA Harriett Jenkins Pre-doctoral Fellowship Program (JPFP) and the NASA Cooperative Education Program at Goddard where she conducted research on sol-gel based biosensors, the fabrication of fiber optics flight cables for the Space Shuttle *Discovery*, carbon nanotubes and polymers for gossamer structures, and polymer materials for robotic skin. Dr. Rutledge received her Ph.D. in chemistry from the American University in 2006. She will provide engineering expertise and support to the JPFP for the Office.

The Office of Higher Education welcomes Dr. Robert Streitmatter, leader of Goddard's High Energy Cosmic Radiations Group. After receiving a B.S. from Northwestern University and a Ph.D. from the University of Chicago, he did postdoctoral work at the University of Maryland. He came to Goddard in 1978 as an NRC Research Associate and became a NASA civil servant working in the High Energy Cosmic Radiations group in 1980. Dr. Streitmatter received the NASA Exceptional Scientific Achievement Medal in 1996 for a series of experimental investigations of antimatter in the cosmic radiation. §

Graduate Students Share Research (GSRP & Jenkins Fellows)

By Tiffany Russell

The Graduate Student Researchers Program (GSRP) hosted its annual symposium this year from September 20–22, 2006. A few Jenkins (Harriett Jenkins Pre-doctoral Fellowship Program) Fellows were also in attendance. The symposium brought together approximately 30 students from across the country who participate in various Goddard-supported research projects. From dark matter research to the development of tungsten glass composite materials, the students were able to meet with the Goddard Technical Advisers, as well as hear oral presentations from their fellow participants. On the first day of the symposium, the students presented their research via a poster session, which Goddard employees were able to see on display in the atrium of Building 28.

Among the students, the poster session was one of the favorite activities of the symposium. It was a great opportunity to get to know each other and learn about their respective research. One student from Mexico City was excited about going to tour the Capitol the next day. The Capitol visit allowed the students an opportunity to learn about some of the intricacies of how the House of Representatives works and some of the hidden treasures the building has to offer.

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Graduate Symposium 2006 attendees

The following day, the students heard talks by Goddard speakers (many former GSRPers) on current research activity at Goddard. Topics covered included hurricane research and future missions to the Moon, Mars, and beyond.

On the last day of the symposium, the students met and dialogued with Dolly Perkins, Center Deputy Director-Technical during a “Can We Talk” session. There was no prescribed agenda; the students’ questions shaped the conversation.

Dr. Katie Blanding, Headquarters Program Manager for GSRP, brought good news about an increase in the GSRP award. Effective in 2007, the fellowship will allow funds to be used for health insurance. Finding funding after the third year, as well as whether or not the new Moon and Mars initiative will leave science in the background, were major concerns posed to Dr. Blanding.

When the question about the future of space sciences was presented to Dr. Blanding, she replied simply with, “It’s not going anywhere. Don’t worry.” For some students it was a brief sigh of relief but there is still uncertainty. Even though the engineering focus of NASA has shifted to getting back to the moon, the space sciences are currently steady with a solid future ahead of them. With the excitement and fire of the fellows participating in the GSRP and the Jenkins Program, it is hard to believe that space sciences will not have a clear future. §

Goddard’s Higher Education Outlook

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